

**REMARKS**

This response is provided in reply to the Notice of Incomplete Response, mailed on September 22, 2006. The due date for response extends to October 22, 2006. For ease of convenience, the complete last response is provided, including the claim amendments.

**I. Copy of previously filed response follows:**

This Amendment is submitted in response to the Office Action dated April 5, 2006. An RCE is being submitted with this paper to enable full consideration of the amendments presented herein.

**Rejections under 35 U.S.C. § 112**

The term "substantially" was removed from the claims, thus obviating the rejection.

**Rejections under 35 U.S.C. § 102(e)**

Claims 1-30 were rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Publication 2005/0042975 ("David"). As mentioned in the earlier response, David provides a CMP apparatus with in-situ measurement through an optical measurement. Because of the measurement device is integrated in the CMP apparatus it can only obtain measurements at a fixed point (i.e., at the window in the pad) below a rotating substrate. The sequence of measurements produce an arc scanning path as shown in Figures 2a-2d of David. Multiple arc paths are capable of being made, as shown in Figure 2D. Producing a path other than an arc would essentially require the wafer or pad to spin or move at a slower rate, thus preventing proper CMP operation.

The claims were amended to further define the "path". As now claimed, the path establishes a spiral over the surface of the substrate. Support is found in the as-filed application, paragraph 34, the figures and other locations. The teachings of David, describe an "arc", and the arc would not be capable of defining a spiral over the surface. Further, the claims were amended to define the sensor(s) *directly over* the surface of the wafer. David teaches to place a sensor at a fixed location under a wafer and at a hole location in the pad,

which covers the sensor when the hole in the pad is traversing over areas other than the sensor location. For at least these reasons, it is submitted that David fails to anticipate the claimed inventions, as amended.

## **II. Updated remarks for Section 103(a)**

### **Rejections under 35 U.S.C. § 103(a)**

Claims 1-30 were rejected under 35 U.S.C. §103(a) as being unpatentable over Sarfaty et al. U.S. Patent 6,608,495 ('495) in view of Caton et al. (U.S. Publication 2005/0046874).

The teachings of Sarfaty et al. define a system for using Eddy and Optical Sensors. As pointed out by the Examiner, reference was made to column 4, lines 15-26. In this section, Sarfaty et al. discloses a sensor positioned on an arm 403. The object 150 can be made to rotate on a turntable 402. Thus, a conducting film 151 can be measured. Sarfaty et al. discloses positioning the sensor at particular points over the conducting film 151, including discussion that any point may be inspected.

Claim 1 as amended, for example, defines:

spinning a substrate having a film;  
scanning an optical sensor directly over and *along a path* over a surface of the substrate, the path establishing *a spiral having greater than one full rotation over the surface of the substrate*;  
*sensing properties* of the film with the optical sensor at *a plurality of points along the path*; and  
generating a map of the film using information from the plurality of points along the path covering the surface of the substrate at each of the plurality of points along the spiral established by the path;  
wherein the generating of the map includes *performing analysis* of light reflected off the surface of the substrate and *applying the results in one of a graphical representation or a text format representation*.

It is noted that Sarfaty et al. defines structures of its apparatus in Figure 4, without reference to specific method teachings of how the movement of the arm 403 is to carryout the process of moving over the surface of the substrate. Sarfaty et al. simply states that rotation of the object 150 is carried out and that movement of the arm 403 can also be controlled. It is pointed out that movement of the arm can happen in any number of ways. For instance, Sarfaty et al. may wish to measure after the rotation stops, move the arm when rotation

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happens, or any number of combinations. Consequently, although Sarfaty et al. discloses structure, the way in which the structure is too vague and open-ended to too many alternatives, which would prevent specific method teachings to define a path establishing a spiral having greater than one full rotation, as defined in the claims. Also, Sarfaty et al. fails to teach sensing at a plurality of points along the path.

In Sarfaty et al., even if its' arm is moved when the substrate is rotated, Sarfaty et al. does not teach or suggest that sensing will occur *during the movement*, such that sensing at the plurality of points along a path occurs.

Also, because too many ways of completing the movement and associated measurements are possible, the office is not permitted to apply inherency, as inherency requires that only one way of achieving the result is possible. By Sarfaty et al.'s own statements, any point can be measured. Consequently, Sarfaty et al.'s structure does not teach the specifically claimed method operations of the present claims.

The Office also acknowledges that Sarfaty is silent regarding the method operation of applying the results in one of a graphical representation or a text representation. Although Caton et al. defines generating a image of the surface at paragraphs 70, 71 and 72, this teaching of Caton et al. does not further complete the missing method teachings of Sarfaty et al., as the path defining the spiral is not taught by either Sarfaty or Caton et al. Consequently, the combination of references fail to teach or suggest each of the elements of the independent claims.

It is noted that each of the independent claims specifically include the method limitations noted to be missing in Sarfaty et al.'s teachings. For at least these reasons, the Office is respectfully requested to withdraw the Section 103 rejections of the claims.

### **III. "Averaging" feature, along the path:**

In reference to claim 11, the applicant has amended the claim to define *an averaging feature*, which is part of one embodiment of the invention. Support can be found at paragraph 49 of the as-filed application. In addition, claim 11 was amended to define the sensor directly over the surface of the substrate. The path is also defined to establish a spiral, where the spiral has greater than one full rotation over the surface of the substrate. Support is found in


the as-filed specification and the as-filed drawings. The map data therefore includes some data that is the result of the averaging. This feature, along with the others defined above and claimed in this embodiment, are submitted to be patentable over the cited art of record.

The embodiment of claim 42 further defines the method operation of moving the arm and the associated sensor over the surface of the wafer, without having another structure between the sensor and the surface of the wafer. Additionally, the path is defined to establish the spiral. The teachings of the cited art fail to teach or suggest this embodiment, as no teaching is provided regarding the arm that is moved to assist in defining the spiral path. For at least these reasons, the Applicant submits that the claims are patentable over the cited art of record.

Further, as the independent claims are submitted to be patentable, the dependent claims are submitted to be patentable for at least the same reasons.

The Applicants submit that all of the pending claims are in condition for allowance. Therefore, a Notice of Allowance is requested. If the Examiner has any questions concerning the present Amendment, the Examiner is kindly requested to contact the undersigned at (408) 749-6901. Also, if any additional fees are due in connection with filing this Amendment, the Commissioner is authorized to charge Deposit Account No. 50-0805 (Order No. LAM2P466). A duplicate copy of the transmittal is enclosed for this purpose.

Respectfully submitted,  
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